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reference, and some brief notes, for each report, and are called for at irregular intervals. A brief final examination is given.

Two to four seniors who have taken this course serve in the department library as student assistants. Three of the men found use for the training in library work in their commercial work during the past summer. One who had also worked in the department library has a good position as "reference librarian" with a large company interested in chemical work.

The library lectures alone have been used for reference by graduate students, especially those who have not had access to large libraries, and wish to learn what is available at Illinois.

MARION E. SPARKS

UNIVERSITY OF ILLINOIS

RESEARCH WORK AT THE UNIVERSITY OF MICHIGAN BIOLOGICAL STATION DURING THE SUMMER OF 1917

RESEARCH work was carried on at the biological station of the University of Michigan, by members of the instructional staff and by a number of students. Because of the lack of suitable laboratory space and equipment, the character of work undertaken was limited largely to systematic and ecological work on plants and animals, the behavior of birds, the embryology of certain fishes and life histories of parasitic worms. This is fundamental work, however, and as knowledge of the local fauna and flora is extended it is desired to give opportunity for careful physiological work. While the cold, late season doubtless interfered with certain investigations continued from previous years, it permitted the securing of many plants in blossom which in ordinary seasons have finished their blossoming before the opening of the station, and by retarding the breeding season of many animals an opportunity was given to take at the height of their breeding season several animals not usually found breeding during the session.

Dr. J. H. Ehlers, of the University of Michigan, collected about two thousand specimens

of flowering plants comprising about two hundred and fifty species. A number of these represented genera and species not included in the published list of this region.

Mr. Lee Bonar, of the University of Michigan, under direction of Dr. Ehlers, collected plants affected with fungous diseases with the view of listing the host plants and studying the parasitic fungi.

Miss Margaret Pengelly, under Dr. Ehlers's direction, made a collection of the grasses of the region. Fifty species were collected, forty-five of which have been identified. Further collections are planned before publication of results.

Miss Lois Smith, of Colorado College, research assistant in botany, was engaged in the collection and study of sedges of the genus *Carex*. This work had been begun in 1914 when forty-nine species were collected and identified. During the past summer a large number of specimens were collected, among them a number of species not included in the previous list. The material is now being studied by Miss Smith and a published report on the work may be expected soon. The specimens belonging to the above collection will be placed in the herbaria of the station and of the university, while some will be available for exchange.

Dr. Richard M. Holman, of Wabash College, and Mr. Ernest Reed, of the University of Michigan, have made a beginning in the study of the aquatic cryptogamic plants. They devoted the greater part of their time to the identification of the algal forms of the lakes and streams of the region, to the study of the topography and hydrography of these lakes, and to collecting such facts as they were able relative to the spatial and seasonal distribution of the forms. Weekly temperature readings were made at ten foot depth intervals at four stations on Douglas Lake and at Lancaster, Munro and Vincent Lakes. Surface plankton hauls were taken at all these stations weekly, and plankton samples were taken at depth intervals of twenty feet in Douglas Lake. Bottom samples were also taken in order to determine diatom species not found

in the plankton during the summer. Many collections of algæ were made in other lakes, in various streams and bogs. Many determinations have been made and considerable preserved material awaits determination.

In plant ecology, instrumental field work on a new phase of the evaporation-plant-succession problem was carried on by B. H. Grisemer, of Sisseton, S. Dak., and E. E. Watson, of the University of Michigan, under the direction of Dr. F. C. Gates. Field work on a descriptive account of the plant associations and their successional relationships was continued and extended by Dr. F. C. Gates, of Carthage College.

Under the direction of Drs. Gates and Holman, the anatomical structure of the leaves of certain land plants, this year growing submerged, was investigated by Miss Mabel Hardy, of the Highland Park, Michigan, High School; the anatomy of *Scirpus validus* from different associations by Miss Winifred Corcoran, student in the University of Michigan, and the anatomical characteristics exhibited by the leaves of the dominant species of the hardwoods and the aspens by E. L. Lambert, of Carthage College.

Professor Max M. Ellis, of the University of Colorado, has brought the survey of the fishes of the region to a point where the publication of results seems desirable. This work has covered three problems: (a) The species of the region; (b) the local distribution of these species and (c) the relations between the existing fish fauna and that of the Great Lakes. Two papers on this work will be ready for publication shortly. He also studied the eggs and embryology of six species of fishes during the summer. Large series of embryo fishes were obtained for comparative studies. The first of these studies will be completed during the winter. Additional collections of a new species of Branchiobdellid worm (description now in press) were obtained, and some experiments concerning the feeding habits and food of these worms were carried on during the summer. These experiments were supplementary to work in progress at the University of Colorado. A collection of Branchiob-

dellid worms was made in the Lake Huron and Potagannissing Bay waters. These worms are in hand at present and the report will soon be sent to press.

Professor Ellis and Mr. G. C. Roe, of the University of Colorado, have recently published a paper in *Copeia* on the destruction of log perch eggs by suckers. This paper was based on data collected at the station during the past summer.

Mr. Roe has completed his collections of mosquitoes started last summer and expects to complete his work on these insects soon.

Dr. A. R. Cooper, of the University of Illinois, research assistant in zoology at the station, devoted his attention to the parasites of the fishes of the region with particular emphasis on the life-histories of the members of the cestode order, Pseudophyllidea. He examined one hundred and fifteen hosts belonging to seventeen species but took only three species of Pseudophyllidea. From young gulls, *Larus argentatus*, several cestodes, probably belonging to the genus *Diphyllbothrium* Cobbold, were taken. Many specimens of a cestodarian worm in various stages of development were taken from suckers.

Mr. H. C. Fortner, working under the direction of Dr. La Rue, studied the parasites of frogs from several localities of the region. Some interesting data on the local distribution of frog parasites were secured. So far as determined at present the only new species found was a species of the tapeworm *Ophiotænia*, which constitutes the first record of the taking of tapeworms of this genus from *Anura* of North America. Further collections are needed to complete the work.

Dr. George R. La Rue investigated the parasites of fishes, birds and snakes of the region. In all seventy-four hosts belonging to nineteen species were examined. A number of species not taken during the summer of 1912 were secured. The collections are being studied and it is hoped that they will yield interesting data on the distribution and life histories of certain parasites.

Professor R. M. Strong, of Vanderbilt University, continued his work on problems of

sense physiology and behavior in birds. For this purpose young herring gulls were secured, kept in a suitable cage on the beach and fed on small dead fishes until during the third and fourth weeks, all of the gulls but one died as the result of heavy trematode infestation secured from the fish. The death of these gulls seriously interfered with the work for a large part of the season.

Professor Strong obtained a considerable amount of data concerning the location of many colonies of breeding herring gulls on the Great Lakes. He also studied the distribution and activities of the herring gull from the standpoint of one of the topics recommended by the committee on zoology of the National Research Council.

Miss Edith Priscilla Butler worked with Professor Strong on the reaction of gulls to sound stimuli. Some interesting data to be published later were obtained concerning the hearing of gulls. Observations were made on the docility of gulls and their capacity for learning.

Mr. E. L. Lambert and Miss Dorothy Cashen assisted Professor Strong in making records of the rate of growth of young birds. Mr. Roland Hussey worked with Professor Strong on the activities and distribution of birds in selected areas near the station. He visited these areas frequently and obtained important data correlated with weather and time conditions.

Mr. F. N. Blanchard, of the University of Michigan, collected data on the habitat and habits of the milk snake, and also did systematic work on this form. He made a determination of the *Cicindelid* fauna of the region, relative abundance of the species, the habitats of the adults and the habits of some of the more abundant species.

GEORGE R. LA RUE,
Director

SCIENTIFIC EVENTS

THE PROPOSED TRANSFER OF THE UNITED STATES NAVAL OBSERVATORY TO THE SMITHSONIAN INSTITUTION

SECRETARY DANIELS has sent the following

letter to Chairman Padgett, of the House Committee on Naval Affairs:

My Dear Mr. Padgett: The Navy Department wishes to express most emphatically its disapproval of H. R. 10954 to change the name of the United States Naval Observatory and to transfer the same to the Smithsonian Institution.

The United States Naval Observatory has grown to its present proportions and position in the astronomical world through the efforts and under the control of the Navy and this department believes that its continued efficiency can best be maintained by retaining the present organization.

Any interference in the work of the observatory at this time when all are engaged in war work in addition to regular routine duties interrupts the supply of nautical instruments to the active fleet which may cause disaster.

The work done to keep up the supply of chronometers, sextants, compasses and other necessary instruments is more or less confidential and it is advisable not to put it in this communication, but it will be furnished in a verbal report if desired.

In addition to its work for the Navy, the observatory has the custody of sextants and chronometers purchased by the Shipping Board.

In March, 1909, the Secretary of the Navy issued an order establishing an astronomical council and stated, "The astronomical work of the Naval Observatory shall be so planned and executed as best to subserve the following purposes and no others, to wit:

"To furnish to the Nautical Almanac Office, as far as may be possible, such observations and such data as may be needed for carrying out the purpose of the law under which the appropriations for that office are made from year to year, which is as follows:

"'For . . . preparing for publication the American Ephemeris and Nautical Almanac and improving the tables of the planets, moon and stars . . .'

"The principal work of the observatory shall be in the field of the astronomy of position as distinguished from astrophysical work, and shall be the continued maintenance of observations for absolute positions of the fundamental stars and of stars which are to be made fundamental, and in addition the independent determination by observations of the sun, of the positions of the stars, moon and planets with reference to the equator and equinoxes.

"TRUMAN H. NEWBERRY,
"Secretary"